UniMano 1000
Pressure Vacuum Series
800-Series

July 2009

INSTRUCTION MANUAL
FOR

800-2000
800-4000
800-5000

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Quality Assurance

Netech Corporation is ISO 9001-2000 Registered. This instrument was thoroughly tested and inspected according to Netech's ISO 9001-2000 quality standards (ISO/IEC 17025) and test procedures, and was found to meet those specifications when it was shipped from the factory.

Warranty

Netech warranties the UniMano 1000 Series Pressure Meters against defects in materials and workmanship for one year from the date of original purchase.

During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective, provided you return the product shipping prepaid to Netech Corporation. This warranty does not apply if the product has been damaged by accident or misuse, or as the result of service or modification by other than Netech Corporation, or if its serial number is defaced or removed.

Netech reserves the right to discontinue the UniMano 1000 Series Pressure Meters at any time, or change its specifications, price, or design without notice and without incurring any obligation. Netech will make a concerted effort to supply service parts for 5 years after discontinuation.

The warranty is void if you elect to have the unit serviced and / or calibrated by someone other than Netech.

The purchaser assumes all liability for any damages or bodily injury that may result from the use or misuse of the unit by the purchaser, his employees, agents or customers.

In no event shall Netech Corporation be liable for consequential damages.

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1.1 INTRODUCTION

GENERAL DESCRIPTION

The UniMano 1000 is an advanced microcontroller based, compact, high performance pressure and vacuum meter designed for very precise measurement and calibration of pressure and vacuum in medical, laboratory and industrial applications. The UniMano 1000 combines such features as fluid compatibility, temperature compensation, linearity correction, leak detection, peak hold, over pressure alarm and user selectable units of measurement. It is menu driven and simple to operate. All the functions are set from a 2 line, 16 character LCD display and a key pad with 8 tactile keys. Using state of art technology, the UniMano 1000 provides superior accuracy and performance. Many software upgrades will be made available to accommodate additional features and advanced functions.

1.2 SPECIFICATIONS

Display:
2 Line 16 character LCD.

Polarity Display:
The negative sign (-) is displayed when there is a vacuum reading.

Accuracy:
0.1% full range, +/- 1 count (Pressure Only).

Operating Temperature:
0 degree C to 50 degree C

Media Compatibility:
Non-corrosive fluids and gases

Maximum Pressure:
Double the rated Pressure.

Power:
One 9 volt alkaline battery or optional AC adapter.

Low Battery Indicator:
Audio and visual display if battery voltage is ≤ 6.8 volts. Unit will go into sleep mode.

Physical Dimensions:

Size: 5.5 x 3.5 x 1.5 in (13.75 x 8.75 x 3.75 cm)
Weight: 10 oz (.28 kg)

Range and Resolution for UniMano 1000 Standard Models:

800-2000

Unit	Pressure	Vacuum	Resolution
MmHG	1500	517	0.5
inH_2O	800	276.9	0.3
MBar	2000	689.7	0.7
cmH_2O	2100	703	0.7
KPa	200	68.97	0.07
InHg	60	20.36	0.02
Psi	30	10	0.01
kg/cm^2	2	0.703	0.0007

800-4000

Unit	Pressure	Vacuum	Resolution
MmHG	3000	517	1
inH_2O	1600	277	1
MBar	4100	690	1
cmH_2O	4200	703	1
KPa	400	69	0.2
InHg	120	20.4	0.1
Psi	60	10	0.02
kg/cm^2	4	0.704	0.002

800-5000

Unit	Pressure	Vacuum	Resolution
MmHG	5000	517	1
inH_2O	2700	277	1
MBar	6800	690	1
cmH_2O	7000	703	1
KPa	690	68.9	0.1
InHg	200	20.4	0.1
Psi	100	10	0.1
kg/cm^2	7	0.703	0.001

1.3 ACCESSORIES

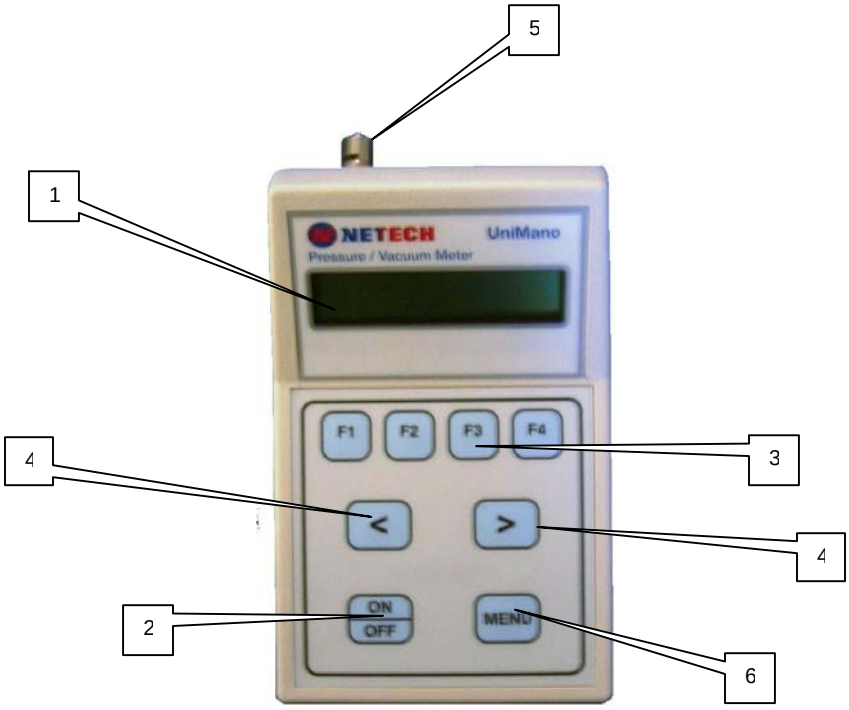
Description	Part Number
User Manual	800-Manual

1.4 OPTIONAL ACCESSORIES

Description	Part Number
110 VAC Adapter	302
220 VAC Adapter	302-220
Syringe Pressure Applicator	204
Tubing And Connector Set	203
Soft Carrying Case	501

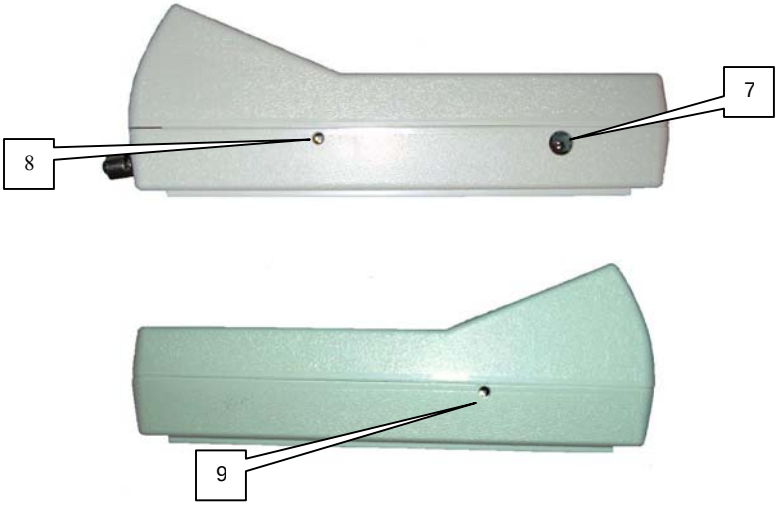
2.1 CONTROLS AND INDICATORS

1. **Display Screen**
2. **ON/OFF Key Pad**
3. **Function Selection Keys**
4. **Scroll Functions Keys**
5. **Luer Lock Fitting (Female)**
6. **Function Menu Key**
7. **AC Adapter Input**
8. **Zero Adjust (R11)**
9. **Fine Gain Adjustment**



UniMano Pressure Meter

Figure 1



Side Views

Figure 2

2.2 PRECAUTIONS

Because the UniMano 1000 is both a Pressure and a Vacuum Meter it will read below zero identifiable by the negative sign in front of reading.

Do not exceed the rated maximum pressure of the instrument, although a transient pressure of two times the rating will generally be tolerated.

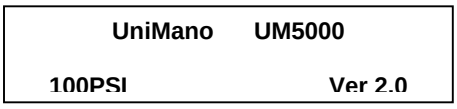
Do not connect the instrument to corrosive gases or highly ionic fluids.

Do not continue to use if the instrument is wet.

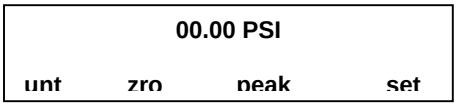
If the battery voltage is lower than 6.8 Volts “Battery Low” warning will be displayed. The UniMano 1000 will beep twice, to warn the user to turn the unit off. The microcontroller will go into a sleep mode thereby disabling any pressure measurements.

2.3 NORMAL OPERATION

Press the ON/OFF to activate the UniMano 1000. On startup the microcontroller will initiate a self check, beep and briefly display the Model and Version of software.



The display will then revert to:



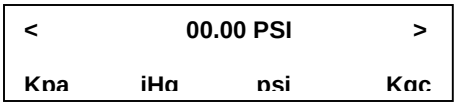
Allow two minutes for the transducer to warm up and stabilize.
The top line is your measurement line and the second line is your select function line.

Press an [F] key to select which function you wish.

unt: **Different Units of Measurements**
zro: **Zeroing the display**
peak: **Peak value capture**
set: **Alarm and Leak Detection**

The 800-2000 will turn on in the mmHG unit of measurement, while both the 800-4000 and 800-5000 default to the PSI unit of measurement.

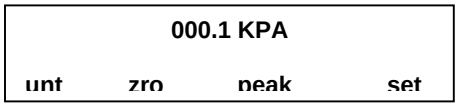
To select another engineering unit to be displayed simply press [F1] and the display will show the various units of measurements available.



Kpa: **KiloPascal**
iHg: **Inches of Mercury**
psi: **Pounds per Square Inch**
Kgc: **kilogram-force/square centimeter**
mmHg: **millimeters of Mercury**
iHo: **inches of Water**
mBr: **milliBars**
cHo: **centimeters of Water**

Use the [<] or [>] keys to bring your choice to the display and then press the appropriate [F] Key to select your choice. For example pressing [F1] for kilopascal.

Once your unit of measurement is selected you can press [MENU]



Your display should revert back to your basic functions

With **no pressure applied**, the display should read zero, if not, press [F2] to automatically adjust the zero.

Once the UniMano is zeroed you may apply pressure and the display will accurately show the actual pressure applied in your selected unit of measurement.

2.4 PEAK OPERATION

If your input pressure is variable and you wish to see the highest value obtained over a period of time simply press [F3] or peak. On the display the function “peak” will continually flash while in peak mode.

While in “peak mode” the display will only display the highest value seen, lower value will not be displayed.

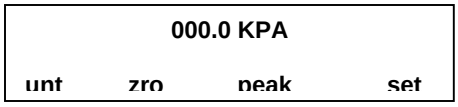
Simply press [F3] again and the flashing will stop and the display will return to real time measurements.

Warning

Reverting to real time from peak will result in loss of peak pressure reading. Record the peak value prior to returning to normal real time reading.

2.5 SET OPERATION

Press set from main menu



The following display will appear:

2.5.1 LEAK DETECTION

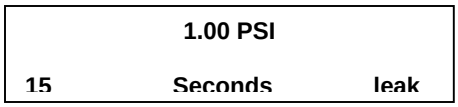
The UniMano 1000 is capable of calculating the change in pressure over a selected period of time.

Press [F1] Leak to select Leak Detection and the following menu appears:

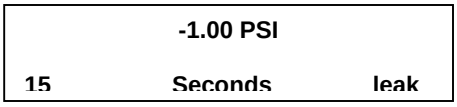
Use the [F] keys to determine the time span for the period of time you wish to measurement to occur. Time intervals are in 15 second durations up to a minute.

Once selected the display will revert back to the main display.

At the end of the selected measuring period the UniMano will beep and flash the change in pressure value (5) five times and then the value freezes on the display.



In the above example the UniMano detected a 1 PSI leak over 15 second period, on negative sign in front would indicate a increase in pressure of 1 PSI over the same 15 Second interval, see below.



2.5.2 Alarm Mode

The UniMano has an audio beeper that always activate during a overpressure situation, for low battery situation and after Leak Detection. If you press [F2] in the Setup Menu and select 'ON' [F1] the UniMano will also beep when zeroing the unit and if Peak Function is selected. Pressing 'OFF' [F2] will deactivate these two alarms. The UniMano will default on initiation to the 'OFF' position.

Beeper	OFF
ON	OFF

2.6 SIMPLE TROUBLESHOOTING GUIDE

When inaccurate pressure vacuum readings are suspected, check the following items:

Install a fresh 9 Volt battery.

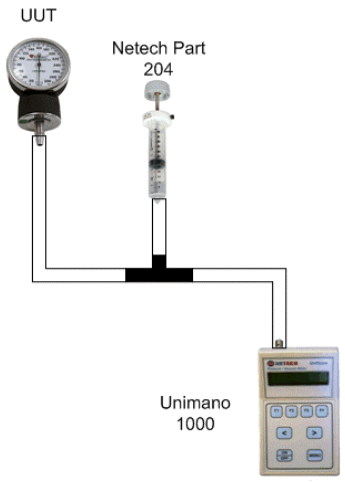
Insure the display reads zero with no pressure applied to the instrument.

Auto zero if necessary.

Apply a known pressure, and verify the reading within the specifications of the UniMano 1000 model, 0.1% Full Scale

2.7 TYPICAL APPLICATION SET UP

Typical Set Up Configuration



3.1 FACTORY CALIBRATION

The UniMano 1000 Series Pressure Vacuum Meter is shipped from the factory fully calibrated with a Certificate of Calibration traceable to the NIST. Annual calibration is recommended. Contact the Customer Service Department for instructions for returning the instrument to Netech for either calibration or repair.

Extended Warranty Option:

If the instrument is returned to Netech Technical Service for its recommended annual calibration, the standard one year warranty is extended for a second year.

Before attempting calibration please be aware that the warranty on the UniMano 1000 Series Pressure Vacuum Meter will become void if the Quality Seal is broken without proper factory authorization.

Appendix A